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Correlates of Past Year Dental Health Visits Among Black Men: From the Black Men's Health Study of Indiana

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CORRELATES OF PAST YEAR DENTAL HEALTH VISITS AMONG BLACK MEN: FROM THE BLACK MEN'S HEALTH STUDY OF INDIANA

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ABSTRACT

Stapleton, Shauna S. M.P.H., Purdue University, May 2013. Correlates of Past Year Dental Health Visits Among Black Men: Findings from the Black Men's Health Study of Indiana. Major Professor: Haslyn Hunte.

Objective: This study aimed to examine correlates of past year dental health visits among Black Men of Indiana.

Methods: A 2011 health needs assessment was taken from a convenience sample of 1,444 Black men from 12 Indiana counties. Participants represented a wide range of socioeconomic backgrounds. Utilizing logistic regression analysis, compensating for clustering by county, predisposing and enabling factors were explored to determine their correlation to dental health visits within the previous year. Predisposing factors included age, sex, marital status, educational level, and employment status. Enabling factors included household income level, health insurance, place of sick care, smoking status, self-rated health, poor mental health days, social support, and fruit and vegetable servings per day.

Results: Overall, 42% of the men surveyed had visited the dentist during the previous year. Preliminary analysis of the full model showed that those who were married (Odds Ratio (OR) = 1.34, $p<0.01$), had a higher household income (OR = 1.83, $p<0.05$), possessed health insurance (OR=1.75, $p<0.001$), had a usual place of sick care (OR = 1.42, $p<0.05$), and consumed fruit everyday (OR=1.81, $p<0.05$) were significantly more likely to visit the dentist in the previous year. Rarely or never

having social support (OR = 0.54, $p<0.01$) had a significant negative association to dental health visits within the previous year.

Conclusion: Correlations were found for both predisposing and enabling factors and should be considered when aiming to increase dental health visits among adult Black men during health promotion programs.

CHAPTER 1. INTRODUCTION

Oral health disparities exist between racial/ethnic minorities and White populations throughout the life course (1-5). In particular, Blacks are more likely than Whites to have experienced some form of tooth decay or to have teeth extracted within their lifetime (1, 2). Regular dental health visits provide dental health cleanings that can prevent these oral health problems. Furthermore, according to Healthy People 2010 baseline data, Black men, when compared to Black females and other racial groups, have the highest incidence rate of oral cavity and pharyngeal cancers in the country (1). For the years 2000-2006, the National Institute of Health reports an oral cancer incidence rate of 17.2 per 100,000 among Black males compared to 15.7 for White males and 9.2 for Hispanic males (6). In addition to suffering from poor oral health outcomes, Vargas and colleagues (4) reported that in the age group 65 and older, Black men suffer greater mortality due to oral health diseases than White men or women of both racial categories. This could be the result of Blacks being more likely than Whites to be diagnosed with late stage oral cancers (7, 8), which could partially be due to a lack of early detection among Black men (9). To address the high oral cancer incidence rate among Black men the National Institute of Dental and Craniofacial Research and the National Cancer Institute launched a campaign, "Oral Cancer: What African American Men Need to Know," addressing the importance of early detection. The earlier the diagnosis of abnormal tissue the better the prognosis, (10), which is achieved through yearly dental health checkups (11), yet little research has focused on determinants of dental healthcare visits among Black men.

Improving access to dental health care is a top priority of Healthy People 2020 (12) because of lower utilization rates among racial/ethnic minorities and the elderly.

Dental health care is an essential part of prevention and treatment of oral diseases and cancers, but there is a gap between White and Black populations and their utilization of services. The 2011 report on United States Statistics from the National Health Interview Survey indicated that for the age groups 18-64 and 65 years or older, 53.1% and 40.6% respectively of Blacks versus 62.4% and 59.3% respectively of Whites reported visiting a dentist in the past year (9). This indicates that Blacks are receiving fewer dental cleanings and oral cancer screenings, due to fewer dental health visits, which could result in worse oral health outcomes.

Several factors may be influencing why Black men do not utilize routine dental services at the same rate as other racial/ethnic groups. The widely utilized behavioral model of healthcare utilization, developed by Andersen (13), has also been applied in previous dental health utilization research (14-16) and is the framework for this study. Used in dental health care research to determine predictors of utilization among participants, the Andersen utilization model includes predisposing, enabling, and need factors. Pre-disposing characteristics are classified as demographic (age, gender), social structure variables (social environment, race/ethnicity) and health beliefs. Enabling resources include personal/family characteristics (income level, health insurance, regular place of care, social interactions) and community resources. Need is represented by perceived presence of illness or evaluated presence of illness by a professional. This study expands on the Andersen model by including psychosocial factors and exploring predictors of dental healthcare utilization among black men, such as fruit and vegetable consumption and social support, beyond the common predisposing and enabling factors.

These additional determinants are relevant to explore because of their relationship to oral health. For example, several studies report that individuals with worse oral health status also had poor nutritional status (3, 17-20), which could result in higher oral cancer rates (21). Fruits and vegetables contain vitamins and nutrients that may provide protective factors against the development of oral cancer (21), yet Blacks may be consuming fewer fruits and vegetables than Whites. Schoenberg and colleagues examined the oral health and nutritional consumption disparities between White and Black participants 65 years and older (3). Black participants were more likely than

Whites to report chewing difficulties affecting their ability to consume a whole apple or to chew other fruits and vegetables (3). The inability to consume fruits and vegetables, due to dental health problems that have not been resolved through dental health visits, could be increasing the risk of Black men to develop oral cancers. By including vegetable and fruit consumption in our analysis we can determine if individuals who are visiting the dentist are consuming more fruits and vegetables on a daily basis.

In addition to fruit and vegetable consumption, this study explored the influence of social support and marital status on dental health visits. The association between dental healthcare utilization and different types of social interactions has recently been explored among oral health researchers. For example, several studies have found significant positive relationships between social support and dental health care visits (22-25) Gironda and colleagues, using data from the National Health Nutrition Examination Survey, reported that individuals, 40 years and older, who reported having more family, friends, and financial help were more likely to have visited the dentist within the preceding year, but no association was found between dental health visits and marital status (23). However, other studies have reported associations between marital status and dental health care visits; one study in particular, discovered that social interaction, social participation, neighborhood cohesion, and marital status were all significant predictors of whether older adults visited a dentist (22). Different types of social interactions may play important roles in enabling individuals to utilize the dental healthcare system. For instance, social support could be providing financial support, heightened awareness of dental hygiene, or providing transportation resources. Due to the limited published research on the importance of social interactions for dental healthcare utilization among Black men, our study aims to document the influence of social support and marital status on dental health care utilization among Black men.

Another important factor in receiving dental healthcare services is the ability of individuals to pay for treatment. The American Dental Association released a report, from 2000-2010, showing a decrease in dental health care utilization rates for all adults, despite their income bracket (26). However, the decrease predominantly affected the lowest income groups, who showed the largest declines in utilization of health care

services. This may likely be due to the wide-scale reform of dental insurance over the past decade. Most low-income adults do not have access to private dental insurance and few states now offer dental insurance through their Medicaid programs (26). The inability to pay for regular dental health visits may be contributing to delay of cancer prognosis. A retrospective study looking at health insurance status discovered that the uninsured and Medicaid dependent individuals with head and neck cancers were more likely to be diagnosed with a late stage prognosis than privately insured patients, despite controlling for alcohol and tobacco use (27), likely due to a delay in care-seeking. To expand upon these reports, a goal of this study is to analyze educational attainment, income level, and health insurance status within the same model to determine the net affect of each factor on dental health care utilization.

Because Black men suffer from high rates of morbidity and mortality from poor oral health outcomes and the lack of research devoted to this area this study has explored correlates of dental utilization among Black men. Specifically, there were two primary aims (1) to document dental health care utilization rates among Black men and (2) to examine predictors of dental health care visits among Black men, including predisposing, enabling and psychosocial variables.

CHAPTER 2. METHODS

2.1 Study Design

The Indiana Minority Health Coalition conducted a cross-sectional survey of Black men, the Black Men's Health Study, across 12 Indiana counties from April 2011 through February 2012. The survey measured items pertaining to health behaviors, healthcare access, physical and mental health conditions, psychosocial supports, and socioeconomic status. A large number of questions were taken from the Behavioral Risk Factor Surveillance System. Interviewers, trained members of the community, used convenience and snowball sampling to recruit a large sample of Black men from community settings such as libraries, community centers, and health fairs within the selected Indiana counties. Recruitment fliers were distributed to potential participants who were eligible if they were 18 years or older, male, and identified themselves as African American/Black. Participants were handed a paper survey to fill out on site, which took about 10 minutes to complete. Verbal consent was obtained from all participants and a $15 gift card was given at completion of the survey. The study was approved by the Institutional Review Boards at both Indiana University and Purdue University.

2.2 Outcome Variable: Past Year Dental Health Visit

The outcome of interest was past dental year health visits derived from the following question; "How long has it been since you last visited a dentist or a dental clinic for any reason? Include visits to dental specialists, such as orthodontists." The associated response set to this question was: (a) within the past year (anytime less than 12 months ago), (b) within the past 2 years (1 year but less than 2 years ago), (c) within the past 5 years (2 years but less than 5 years ago), (d) 5 or more years ago, or (e) never.

Based on the current preventative dental utilization recommendation of at least one visit a year- a binary variable was created with a coding of 1 representing past year utilization and 0 representing utilization greater than one year since their last dental health visit.

2.3 Independent Variables

Predisposing Variables: Participants were asked to respond to several demographic variables, including age, marital status, and educational level. Age was coded into 4 categories: 18-34 (reference group), 35-44, 45-64 years, or 65 or more years of age. Marital status was dummy coded into binary variable with a coding of 1 representing being married and 0 representing all other categories (divorced, widowed, separated, never married, a member of an unmarried couple). Educational level was coded into 4 categories: less than 12 years of education (reference group), a high school diploma or GED, some college or trade school, or a college graduate.

Enabling and Psychosocial Variables: Participants answered questions in regards to their employment status, smoking status, household income, fruit and vegetable consumption/day, number of poor mental health days, place of sick care, frequency of social support, health insurance status, and self-rated health status. Employment status was dummy coded with 1 representing being employed and 0 representing all other categories (self-employed, out of work, a student, retired, unable to work). Smoking status was coded into three categories: never smoker (reference group), current smoker, and past smoker. Participants were asked, "how many servings of fruit do you eat in an average day? A serving of fruit is a medium whole fruit like apples, peaches, pears, a ½ cup of chopped or canned fruit or berries, or a ¼ cup dried fruit, like raisins." They were also asked, "how many servings of vegetables do you eat in an average day? A serving of vegetables is 1 cup of raw vegetables or ½ cup cooked vegetables (not counting French fries or chips)" The answer choices for both questions were (a) none, (b) one, (c) two, (d) three, (e) four, (f) five or more, or (g) don't know/not sure. Fruit and vegetable consumption per day (separate variables) were grouped into three categories: none (reference group), one to two, or three or more servings per day in order to explore the various levels of fruit and vegetable consumption and their individual associations to

dental health visits. Participants were asked where their place of sick care was located: (a) doctor's office, (b) community clinic, (c) hospital emergency room, (d) urgent care center, (e) other-please specify. The variable was dummy coded into doctor's office as 1, and all others as 0 in order to determine if an individual who visited the doctor's office for sick care was also more likely to visit the dentist. Participants were asked, "how often do you get the social and emotional support you need?" This variable was collapsed into three categories: always/usually (reference group), sometimes, and rarely/never. Participants were asked to fill-in the number of poor mental health days in the past month. Individuals reporting no poor mental health days were coded as 1, and individuals reporting at least one or more poor mental health days were coded as 0. Self-rated health was dummy coded into excellent or very good health as 1, and good to very poor health as 0. Health insurance was dummy coded with 1 representing having health insurance and 0 representing not having health insurance.

2.4 Analysis

Although likely missing at random, missing data were imputed using an iterative method that imputes multiple variables by using chained equations, a sequence of univariate imputation methods with fully conditional specification of prediction equations. Chi-square analysis was conducted to determine the level of significance between those who had visited a dentist in the previous year and those who had not for each independent variable. In addition, an individual logistic regression for each independent variable provided an odds ratio between the two groups of dental health visits. Three multivariable logistic regression models were created to explore the predictors of dental healthcare utilization, based on Anderson's health care utilization model (13). All statistical analyses were conducted using the statistical package STATA, version 12.1.

CHAPTER 3. RESULTS

3.1 Sample Characteristics

Table 1 provides information on sample characteristics (n=1,444). Overall 38% were 18-34 years old and less than half were married (34%). Although 57% had some form of higher education (37% had some college/trade school and 20% were college graduates) only 47% were employed and 45% had a household income less than $20,000 per year. In addition, 63% had health insurance, but only 49% of the full sample reported utilizing a physician for sick care. The majority of participants, 62%, reported no poor mental health days in the past month, yet less than half, 41%, reported being in excellent or very good health. While 66% reported consuming at least 1-2 vegetable servings per day, only 8% reported consuming none. There was a similar distribution for fruit servings, with 60% reporting 1-2 servings per day and 17% reporting none. A majority of participants, 57%, reported always/usually having social support.

In addition, Table 1 provides distributions for those who have and have not had a past year dental visit. Out of the 1444 participants, 42% reported a visit in the past year, lower than the national average for males (56% of males aged 18+ (1)). Overall, for each age group, less than half of the participants reported having visited a dentist, while the majority of married individuals had (56%). Educational attainment showed an increasing trend, as years of education increased, so did the proportion of individuals visiting the dentist. Only 26% of those without health insurance, and 29% of those making less than 20,000 per year visited a dentist in the previous year. In addition, a greater proportion of current smokers (70%), those with greater than one poor mental health day (62%), and with less than excellent or very good self-rated health (62%) had not been to the dentist. Furthermore, only 31% of participants, who did not use the physician's office for care, visited the dentist.

Vegetable and fruit servings per day and higher frequency of social support were also associated with higher levels of dental visits. As the number of vegetable and fruit servings consumed per day and the amount of social support increased so did the proportion of individuals having visited the dentist. Thirty percent of individuals consuming no fruit versus 48% of individuals consuming 3 or more servings per day and 49% of individuals reporting always/usually versus 26% of individuals reporting never/rarely having social support had been to the dentist.

Table 1. Sample Characteristics of Participants in the Indiana Black Men's Health Study (n=1444)

	Full Sample		Dental Visit in Past Year				
			No		Yes		p-value[d]
	No.	%	No.	%	No.	%	
All	1444	100	837	57.94	607	42.06	
Age							
18-34 years	553	38.28	354	64.08	199	35.92	
35-44 years	273	18.89	156	57.09	117	42.91	
45-64 years	507	35.08	269	53.02	238	46.98	
65+ years	112	7.74	59	52.50	53	47.50	<0.01
Marital Status							
Other[a]	960	66.50	622	64.82	338	35.18	
Married	484	33.50	215	44.37	269	55.63	<0.001
Educational Attainment							
<12 years	102	7.06	75	73.96	27	26.04	
HSD/GED	513	35.54	338	65.87	175	34.13	
Some College/Trade	542	37.51	302	55.81	239	44.19	
College Graduate	287	19.89	122	42.36	166	57.64	<0.001
Employment Status							
Other[b]	763	52.82	467	61.27	296	38.73	
Employed	681	47.17	366	53.79	315	46.21	<0.01
Health Insurance							
No	539	37.35	401	74.28	139	25.72	
Yes	905	62.65	436	48.23	468	51.77	<0.001
Household Income Level							
<20,000	646	44.75	460	71.21	186	28.79	
20-35,000	319	22.09	191	59.86	128	40.14	
>35,000	479	33.16	187	38.96	292	61.04	<0.001
Smoking Status							
Never Smoker	762	52.78	400	52.44	362	47.56	
Past Smoker	244	16.90	133	54.47	111	45.53	
Current Smoker	438	30.32	305	69.65	133	30.35	<0.05
Poor Mental Health Days							
One or More Last Month	547	37.87	341	62.38	206	37.62	
None	897	62.13	496	55.32	401	44.68	<0.05
Self-Rated Health Status							
Good/Fair/Poor/Very Poor	848	58.75	525	61.84	324	38.16	
Excellent/Very Good	596	41.25	313	52.47	283	47.53	<0.05
Place of Sick Care							
Other[c]	738	51.08	511	69.32	226	30.68	
Physician's Office	706	48.92	326	46.17	380	53.83	<0.001
Vegetable Servings/Day							
None	118	8.14	74	63.30	43	36.70	
1-2 Servings	958	66.32	559	58.37	399	41.63	
3-5 Servings	369	25.54	204	55.31	165	44.69	<0.05
Fruit Servings/Day							
None	241	16.69	168	69.71	73	30.29	
1-2 Servings	869	60.17	496	57.07	373	42.93	
3 or More Servings	334	23.14	174	52.01	160	47.99	<0.001
Frequency of Social Support							
Always/Usually	827	57.24	422	51.01	405	48.99	
Sometimes	392	27.17	247	63.04	145	36.96	
Rarely/Never	225	15.58	167	74.02	58	25.98	<0.001

[a]Includes Divorced, Widowed, Separated, Never Married, A Member of An Unmarried Couple
[b]Includes Self-employed, Out of Work, A Student, Retired, Unable to Work
[c]Includes Community Clinic, Hospital Emergency Room, Urgent Care Center and Non-Traditional Places
[d]P-value based on chi-square analyses

3.2 Table 2 Results

Table 2 depicts the results of the bivariate analysis for each independent variable. Participants who were older, married, and had a higher education were significantly more likely to visit the dentist than younger, unmarried, less educated individuals. In addition, people who had health insurance (Odds Ratio (OR)=3.11, 95% Confidence Interval (CI)=2.46,3.93) and those who had a household income of $20,000 or more per year were more likely to have been to the dentist than those without health insurance or with a lower household income. Current smokers (OR=0.48, 95% CI=0.37,0.62) were significantly less likely to have visited a dentist than never smokers. Participants reporting no poor mental health days (OR=1.35, 95% CI=1.08,1.69) or utilizing the physician's office for sick care (OR=2.68, 95% CI=2.15,3.33) were significantly more likely to have visited the dentist than those with at least one poor mental health day or using another place for sick care. Fruit consumption was also significant; those consuming 3-5 servings per day were 2.17 times more likely to have seen a dentist than those consuming none. Finally, social support was also related to dental health visits; participants who reported sometimes (OR=0.62, 95% CI=0.48,0.81) or rarely/never receiving social support (OR=0.37, 95% CI=0.25,0.53) were significantly less likely to have visited a dentist than those who always/usually received social support

Table 2. Bivariate logistic regression comparing each correlate to dental health visits (n=1444)

	Odds Ratio (95% CI)	
Age		
18-34 years (reference)	1.00	
35-44 years	1.33	(.99,1.80)
45-64 years	1.59***	(1.24,2.04)
65+ years	1.65*	(1.09,2.49)
Marital Status		
Other[a] (ref)	1.00	
Married	2.34***	(1.87,2.93)
Educational Attainment		
<12 years (reference)	1.00	
HSD/GED	1.42	(0.87,2.31)
Some College/Trade	2.20**	(1.35,3.60)
College Graduate	3.81***	(2.28,6.37)
Employment Status		
Other[b](reference)	1.00	
Employed	0.97	(0.91,1.04)
Health Insurance		
No (ref)	1.00	
Yes	3.11***	(2.46,3.93)
Household Income Level		
<20,000 (ref)	1.00	
20-35,000	1.50*	(1.07,2.09)
>35,000	3.82***	(2.88,5.07)
Smoking Status		
Never Smoker (ref)	1.00	
Past Smoker	0.91	(0.67,1.23)
Current Smoker	0.48***	(0.37,0.62)
Poor Mental Health Days		
One or More Last Month (ref)	1.00	
None	1.35**	(1.08,1.69)
Self-Rated Health Status		
Good/Fair/Poor/Very Poor (ref)	1.00	
Excellent/Very Good	1.49***	(1.20,1.84)
Place of Sick Care		
Other[c](ref)	1.00	
Physician's Office	2.68***	(2.15,3.33)
Vegetable Servings/Day		
None (ref)	1.00	
1-2 Servings	1.28	(0.84,1.96)
3 or More Servings	1.49	(0.94,2.37)
Fruit Servings/Day		
None (ref)	1.00	
1-2 Servings	1.73**	(1.27,2.37)
3 or More Servings	2.17***	(1.51,3.10)
Frequency of Social Support		
Always/Usually (ref)	1.00	
Sometimes	0.62***	(0.48,0.81)
Rarely/Never	0.37***	(0.25,0.53)

[a]Includes Divorced, Widowed, Separated, Never Married, A Member of An Unmarried Couple

[b]Includes Self-employed, Out of Work, A Student, Retired, Unable to Work

[c]Includes Community Clinic, Hospital Emergency Room, Urgent Care Center and Non-Traditional Places

*P<0.05, **P<0.01, ***P<0.00

3.3 Table 3 Results

Table 3 provides results from the multivariable logistic regression predicting past year dental visits among Black men in the Indiana Black Men's Health Study. Three models were used, the first model includes predisposing predictors, the second model includes predisposing and enabling factors, while the third model includes predisposing, enabling, and psychosocial predictors.

3.3.1 Model 1: Predisposing Factors

The first model included age, marital status, and educational attainment. Participants who were married (OR = 1.93, 95% CI = 1.57, 2.39), had some college/trade school (OR = 2.14, 95% CI = 1.48, 3.11), and had a college degree (OR = 3.19, 95% CI = 2.24, 4.56) were significantly more likely to visit the dentist than those who were not married or had less than 12 years of education, respectively.

3.3.2 Model 2: Predisposing and Enabling Factors

Model 2 included the variables age, marital status, educational attainment, income level, employment status, health insurance, and place of sick care. Black men with a household income level above $35,000 per year (OR = 2.03, 95% CI = 1.14, 3.62) or with health insurance (OR = 1.76, 95% CI = 1.34, 2.32) were significantly more likely to have visited the dentist than those with household earnings of less than $20,000 or without health insurance, respectively. Place of sick care was also a significant predictor; participants visiting a physician's office for sick care (OR = 1.53, 95% CI = 1.18, 2.00) were more likely to visit a dentist than those not using the physician's office for sick care. Being married (OR = 1.37, 95% CI = 1.14, 1.23) and having a college degree (OR = 1.79, 95% CI = 1.22, 2.61) remained significant predictors. However, having some college/trade school was no longer a significant predictor of having a dental visit.

3.3.3 Model 3: Predisposing, Enabling, and Psychosocial Factors

Model 3 included the variables from model 2 plus smoking status, self-rated health, poor mental health days, fruit servings per day, vegetable servings per day, and

frequency of social support. The number of fruit servings consumed per day was significantly related to dental health visits; when compared to those consuming no fruit per day, those eating 1-2 servings per day (OR = 1.57, 95% CI = 1.12, 2.21) and those eating 3-5 servings per day (OR = 1.81, 95% CI = 1.15, 1.85) were more likely to have had a visit. In addition, social support was a significant predictor of whether an individual had a dental health visit in the previous year; when compared to participants reporting always or usually receiving social support, those reporting never or rarely receiving social support (OR = 0.54, 95% CI = 0.36, 0.82) were less likely to have had a dental visit. Marital status, health insurance, and place of sick care remained significant predictors of having visited the dentist. Although attenuated, household income level above $35,000 per year also remained a significant predictor. Having a college degree was no longer a significant predictor.

Table 3. Results from Multivariable Logistic Regression Analyses Predicting Past Year Dental Visit in Black Men's Health Study: Full Model (N=1444)

	Model 1		Model 2		Model 3	
	OR	**[95% CI]**	**OR**	**[95% CI]**	**OR**	**[95% CI]**
Age						
18-34 years old (reference)	1.00	---	1.00	---	1.00	---
35-44 years old	1.05	[0.82,1.34]	0.97	[0.79,1.19]	1.04	[0.85,1.26]
45-64 years old	1.27	[0.98,1.65]	1.03	[0.80,1.33]	1.19	[0.92,1.53]
65+ years old	1.27	[0.93,1.73]	0.75	[0.46,1.23]	0.85	[0.47,1.53]
Marital Status						
Not married[a] (ref)	1.00	---	1.00	---	1.00	---
Married	1.93***	[1.57,2.39]	1.37**	[1.14,1.63]	1.34**	[1.13,1.59]
Educational Attainment						
<12 years (ref)	1.00	---	1.00	---	1.00	---
HS or Equivalent	1.41	[0.96,2.06]	1.16	[0.71,1.89]	1.06	[0.62,1.80]
Some College/Trade	2.14***	[1.48,3.11]	1.49	[1.00,2.23]	1.32	[0.83,2.08]
College Graduate	3.19***	[2.24,4.56]	1.79**	[1.22,2.61]	1.54	[0.98,2.43]
Income Level						
< $20,000 (ref)			1.00	---	1.00	---
$20-35,000			1.16	[0.83,1.62]	1.11	[0.78,1.57]
>$35,000			2.03*	[1.14,3.62]	1.83*	[1.04,3.21]
Employment Status						
Other[b](ref)			1.00	---	1.00	---
Employed			1.07	[0.97,1.18]	1.08	[0.98,1.19]
Health Insurance						
No (ref)			1.00	---	1.00	---
Yes			1.76***	[1.34,2.32]	1.75***	[1.35,2.28]
Place of Sick Care						
Other[c] (ref)			1.00	---	1.00	---
Physician's Office			1.53**	[1.18,2.00]	1.42*	[1.08,1.87]
Smoking Status						
Never smoker (ref)					1.00	---
Past Smoker					0.84	[0.66,1.06]
Current Smoker					0.80	[0.61,1.05]
Self-Rated Health						
Good/Fair/Poor/Very Poor (ref)					1.00	---
Excellent or Very Good					1.28	[0.87,1.88]
Poor Mental Health Days						
One or More Last Month (ref)					1.00	---
None					1.01	[0.80,1.26]
Fruit Servings						
0 Servings/Day (ref)					1.00	---
1-2 Servings/Day					1.57*	[1.12,2.21]
3 or More Servings/Day					1.81*	[1.15,2.85]
Vegetable Servings						
0 Servings/Day (ref)					1.00	---
1-2 Servings/Day					0.76	[0.47,1.22]
3-5 Servings/Day					0.75	[0.42,1.33]
Social Support						
Always/Usually (ref)					1.00	---
Sometimes					0.85	[0.59,1.21]
Never/Rarely					0.54**	[0.36,0.82]

[a]Includes Divorced, Widowed, Separated, Never Married, A Member of An Unmarried Couple
[b]Includes Self-employed, Out of Work, A Student, Retired, Unable to Work
[c]Includes Community Clinic, Hospital Emergency Room, Urgent Care Center and Non-Traditional Places
*P<0.05, **P<0.01, ***P<0.001

CHAPTER 4. DISCUSSION

Several significant predictors of dental health visits among Black men were reported in this study. Forty-two percent of our sample indicated they had visited the dentist in the past year, lower than the national average for men; in 2010 the national average was approximately 56% of males aged 18 years and older (1). Our results, as well as national statistics, show that those aged 65 and older are less likely to visit the dentist, which could be contributed to edentate older adults being less aware of the importance of dental health visits for oral cancer screenings, having fewer economic resources, or lack of social support. Oral health practitioners should engage edentate older Black men about the importance of dental health checkups.

Marital status remained significant across all models. Research has indicated a significant relationship between oral health and marital status. For example, one study in particular that examined data from the Adult Dental Health Survey reported that those who were single, divorced/separated, or widowed were significantly more likely to have lost all of their natural teeth than those who were married (28). This could be contributed to overall higher life satisfaction reported among married individuals (22), resulting in higher self-maintenance through care-seeking behaviors such as dental healthcare utilization. Although education was no longer significant in the third model, the trend was still in the positive direction that as educational attainment increased the likelihood of having visited a dentist also increased. One possible reason for the loss of significance in the third model could be from the addition of social support. Participants with a higher frequency of social support may be receiving positive dental health information from these resources partially alleviating the disadvantage of having a lower education through discussions of oral health recommendations with friends and family.

Place of sick care was also a significant predictor of having visited the dentist. This could indicate that individuals who have a regular physician to provide sick care also have a regular dentist they attend. A possible reason for this correlation is that men who have resources to utilize a physician for sick care, such as access to facilities in their neighborhood or referral services, can also use these resources for accessing dental healthcare resources. In addition, men who are using the physician's office for sick care may be provided more general health knowledge, such as the importance of regular checkups for overall disease prevention and well being.

Although, smoking was not significantly related to dental health visits, those who smoked were less likely to visit the dentist than never smokers, which is the expected direction. Previous research has shown that those who are considered smokers are less likely to utilize the dentist than never smokers (29). However, because our results show that when considering other factors, such as social interactions and financial resources, smoking status may not be as important in predicting dental health care utilization among Black men.

Income and health insurance status were significant predictors of dental health care utilization, in accordance with the Anderson behavioral model of healthcare utilization (13). Income and health insurance are enabling factors, the presence of health insurance and having a higher household income enable individuals to obtain healthcare services. Due to large reforms in the past decade, dental healthcare utilization and access has vastly increased among children, especially those of lower-income families, however, utilization among adults has decreased, specifically among lower-income groups (26). The American Dental Association reports that cost of services remain a substantial barrier to accessing dental health services for adults (26). Few states remain that offer dental health insurance through Medicaid programs for lower-income adults who do not care for young children. In particular, Indiana offers nine different Medicaid programs, but none provide dental health care insurance to lower-income men who are not parents or caregivers of children under the age of 18. In addition, dental health coverage is not included in Medicare plans and the Affordable Care Act lacks provisions that address dental healthcare access. In order to reach Healthy People 2020 goals of decreasing oral

health disparities and increasing access to dental health care, financial barriers must be addressed for lower-income Black men. Our results indicate that providing health insurance is one means that could enable Black men to overcome this barrier in Indiana.

Fruit consumption was significantly related to dental health visits, with more servings resulting in a higher likelihood of having visited the dentist. Black men who consume more fruits may be more cognizant of their overall health, and therefore more likely to visit the dentist. However, surprisingly, vegetable consumption was not significantly related to dental health visits and the relationship was in the opposite direction than expected, participants who consumed more vegetables per day were less likely to have visited the dentist than those who had consumed no vegetables. One possible explanation for the difference in fruit and vegetable consumption and dental health visits could be related to cost. Fruits are typically more expensive than vegetables. Individuals who earned a higher household income and had health insurance were more likely to have visited the dentist and may be more financially stable, enabling them to purchase fruits more readily than individuals earning less money. In addition, individuals who are not visiting the dentist may have oral health conditions that prevent them from being able to consume seed-containing fruit.

Overall, our sample showed a predominantly low percentage of individuals consuming 3 or more servings of fruits and vegetables per day, 23% and 26% respectively. Oral health practitioners should provide oral health nutritional information to Black men, specifically explaining the types of fruits and vegetables that have protective factors for oral health. Research has shown that Black men, although targeted by national campaigns, have relatively low and unchanged levels of consuming recommended levels of fruits and vegetables and consume lower levels of nutrients such as calcium, fiber, and vitamin D that are associated with oral health, as well as insufficient knowledge of nutritional guidelines when compared to White males (3, 30, 31). Oral health providers can play an important role in disseminating key information about oral health nutrition to Black men.

Social support was significantly associated to dental health visits. Black men reporting never/rarely receiving social support were less likely to have visited the dentist

than men who always/usually received social support. Although not statistically significant, Black men reporting low levels of social support were less likely to attend the dentist than Black men reporting that they always/usually received social support. Black men who visit the dentist may have more social support as a result of their better oral health, translating into better social acceptance (32), and it could indicate that the social support Black men receive influences them to visit the dentist. Social support may act as a mechanism that enables Black men to access dental health care by providing them transportation, referring them to resources, and increasing their knowledge of good oral health routines. Individuals who are unable or choose not to engage in dental health services may see a depreciation in their oral health overtime resulting in social isolation, which can serve to further decrease their accessibility to dental health care resources.

In addition, some social support constructs may be more important in influencing Black men to utilize the dentist than others. For example, neighborhood level knowledge and attitudes about visiting the dentist, and oral health practices may positively or negatively influence rates of dental visits among Black males. For instance, there may be stigmas or fears associated with visiting the dentist that are shared between neighbors, barbers and customers, or through other neighborhood relationships resulting in a decreased likelihood of using the dentist. A study that analyzed neighborhood level social constructs (i.e. social support, social leverage, and neighborhood attachment) found that individuals reporting high levels of social support from their neighborhood were less likely to visit the dentist and, as a result, the researchers recommended the need for addressing neighborhood attitudes, knowledge and cultural values during oral health campaigns (33). It is important to further explore the associations of both individual and neighborhood level social resources, attitudes, and knowledge and utilization of dental services in future research.

Despite its findings, this study has several limitations. First, the participants were selected through convenience and snowball sampling; however, this method has been used in previous research and is often necessary for obtaining a large sample of hard-to-reach populations, such as Black men (34, 35). This was also a self-report survey, which could have resulted in biased results. For instance, participants may have overestimated

the number of fruits and vegetables they consume per day, however, our reports of fruit and vegetable consumption rates agree with previous research. In addition, the survey lacked several dental specific items such as dental health insurance, oral health hygiene, and having a regular dentist, which may have been factors in utilization of dental health services. Future research needs to identify rates at which Black men engage in oral health behaviors such as flossing and brushing at home. Because of the cross-sectional nature of this study, future research will need to explore pathways of utilization among Black men.

A major strength of the study was the large sample size of Black men; Black men are underrepresented in the existing oral health literature and, when included, are either grouped with Black females or the sample size is not sufficient to conduct a robust analyses such as the one presented in the study. Because of their high rates of oral morbidity and mortality this group needs to be directly studied to better understand the factors related to maintaining recommended dental health behaviors. Lastly, the study includes predisposing, enabling, and psychosocial predictors, adding to a growing body of literature on determinants of dental health care utilization.

Ours results show that several enabling, predisposing, and psychosocial variables have a positive and significant relationship to utilization of dental health care services among Black men such as being married, having a household income level great than $35,000/year, having health insurance, receiving sick care at the physician's office, consuming fruit daily, and reporting always/usually receiving social support. Public health practitioners and oral health care providers need to consider the social support and nutritional status of Black men in oral health promotion programs or when treating Black men at dental health clinics. In addition, helping Black men overcome financial barriers is important in increasing their utilization of dental health services, such as through policy changes.

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